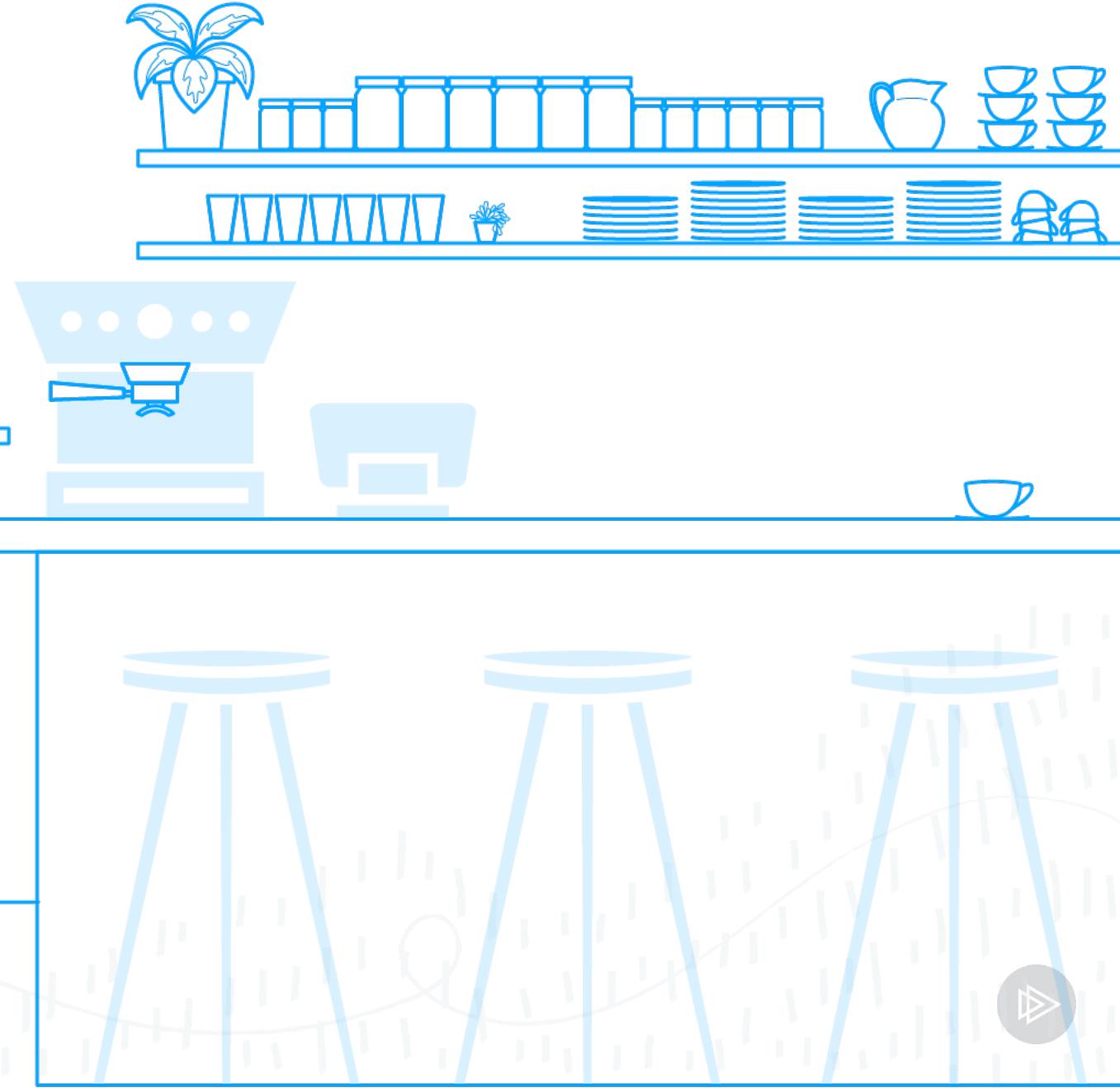
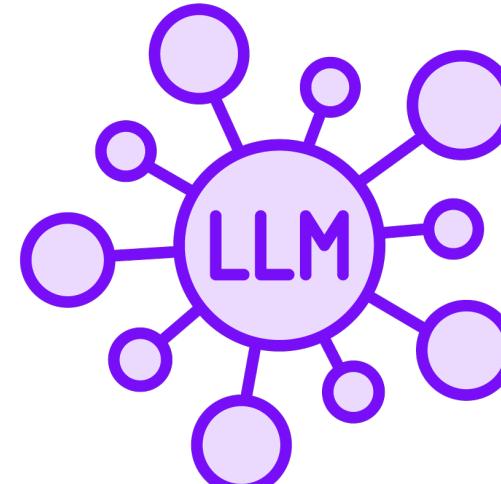
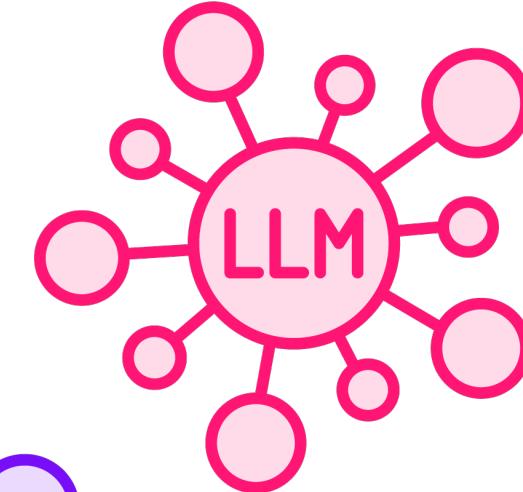
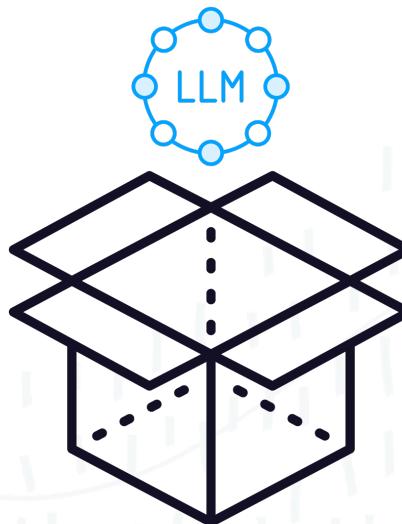
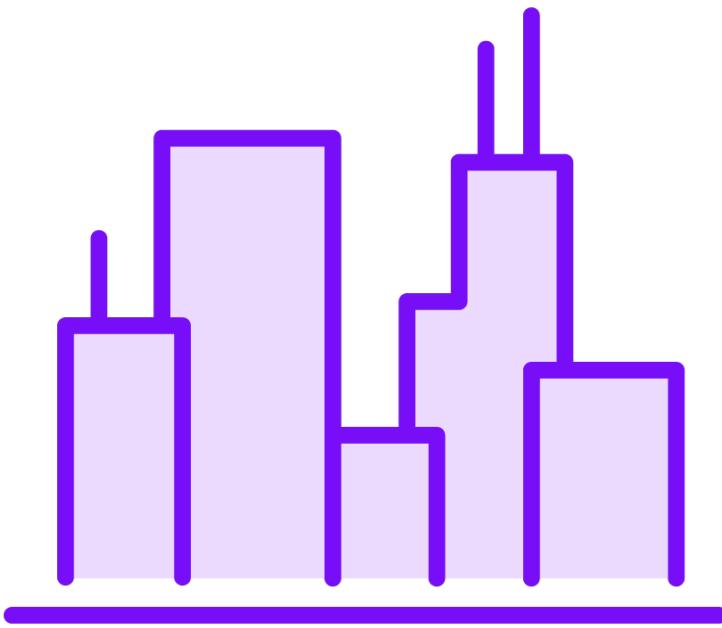


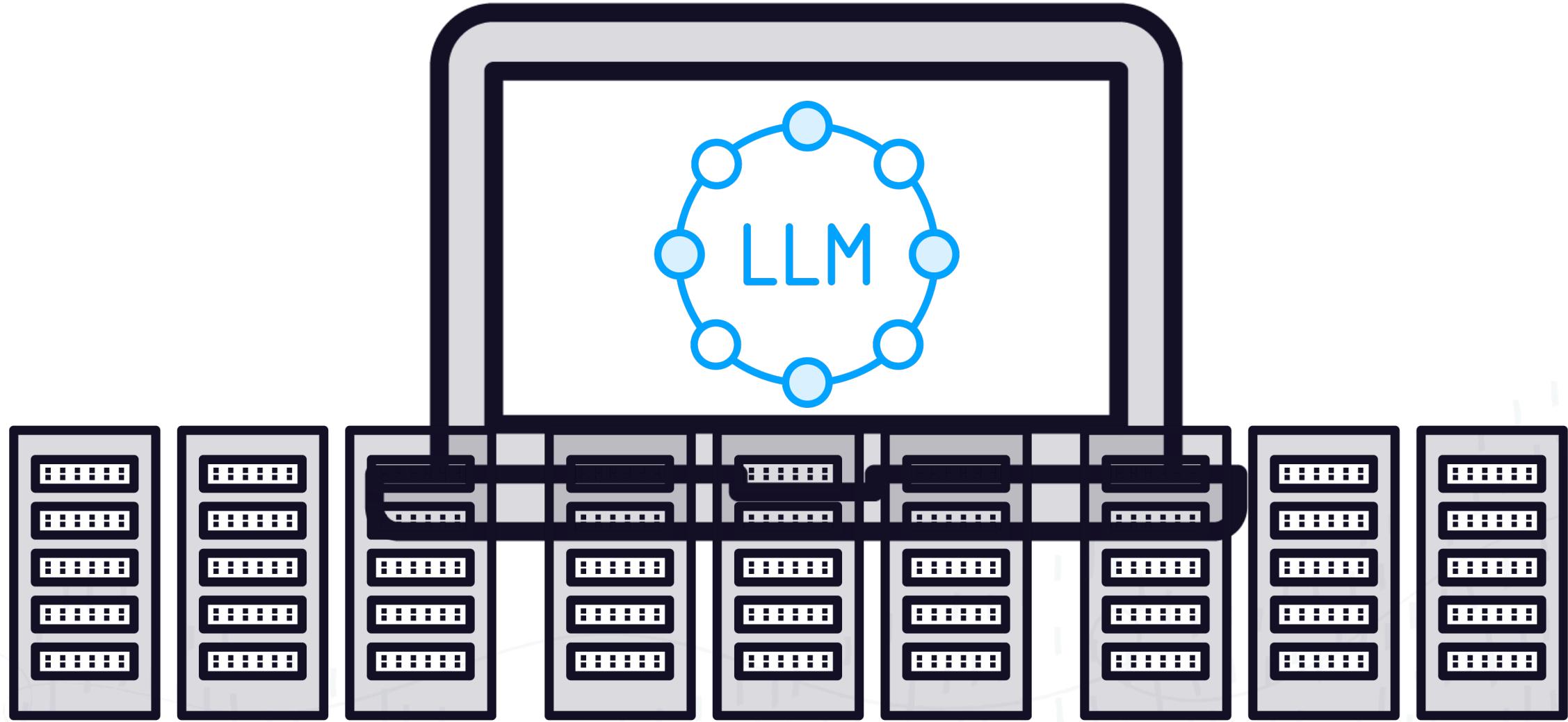


Wow! LLMs
are amazing!









Introduction to Open-source LLMs

Understanding Open-source LLMs

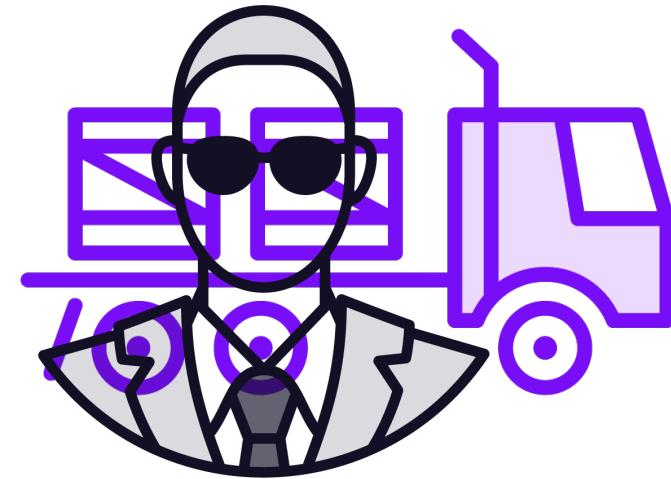


Laurentiu Raducu

Founder of bitheap

@bitheap_tech | www.bitheap.ch





Open vs. Closed-source Models

Open source

vs.

Closed source

Model weights and code are publicly available

Anyone can study how they work

Companies control the model

No access to the model's weights

You can interact with the model through the API or web interface



Features of the Open-source Models

Accessibility

Transparency

Customizable

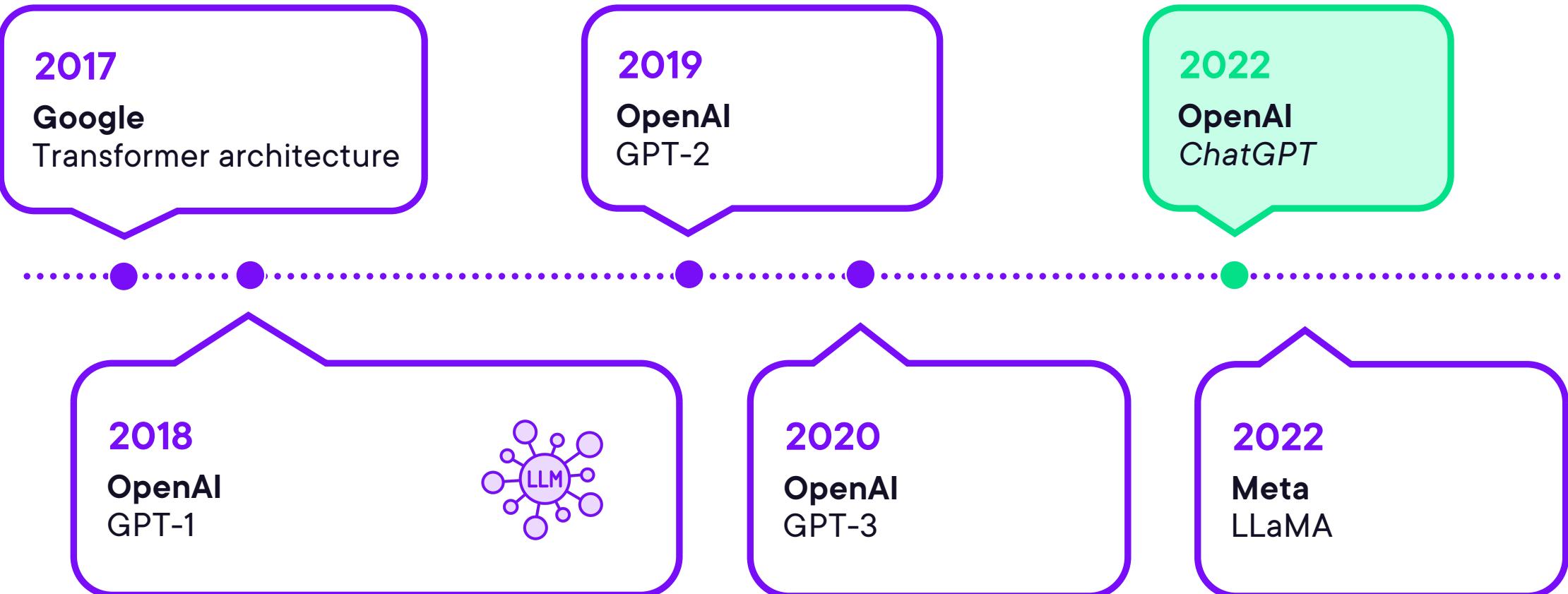
Licensing freedom



The Rise of the Open-source LLM Movement



Timeline of Large Language Models



Source-available Models

Licenses discriminate against certain groups and fields.

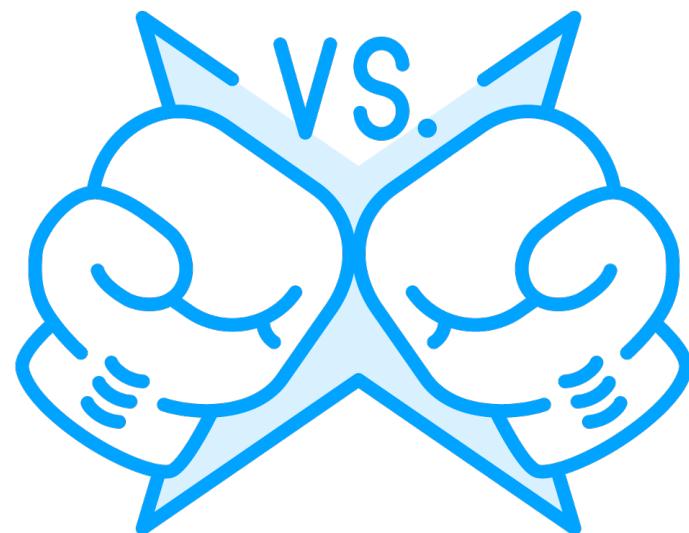
Provisions prohibiting entities with more than 700 million users from using the models.

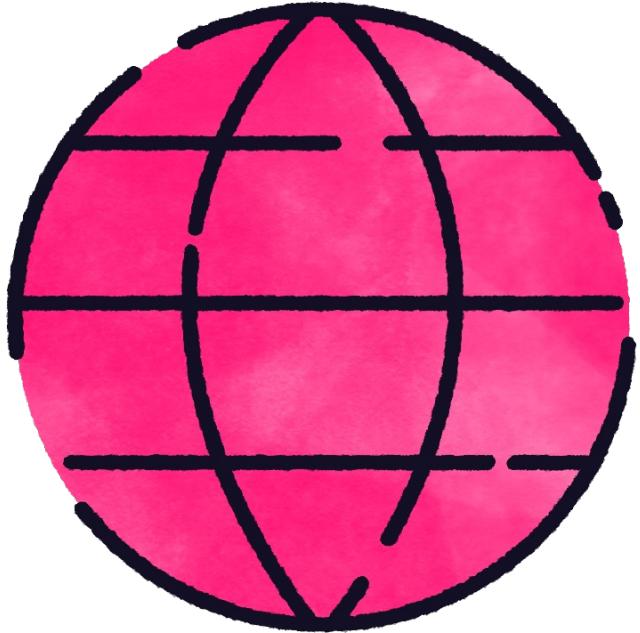


**Models with more
permissive licenses, like
Mixtral 7B and 8x7B started
to emerge.**





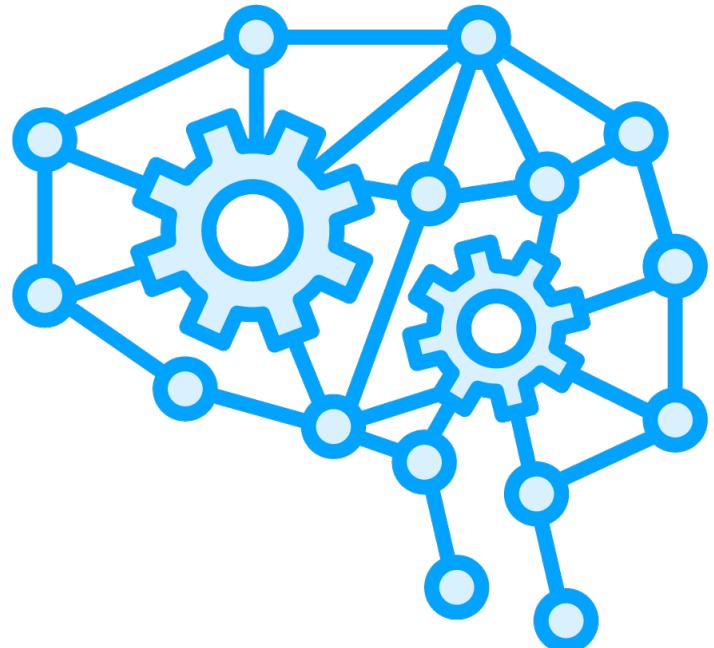




Gemma

- Multimodal
- Supports 140 languages
- Large context window
- Function calling ability





Qwen

- Mixture-of-experts architecture
- Fast inference
- Reduced memory usage
- Good at coding, math, long context retrieval
- Apache license





DeepSeek

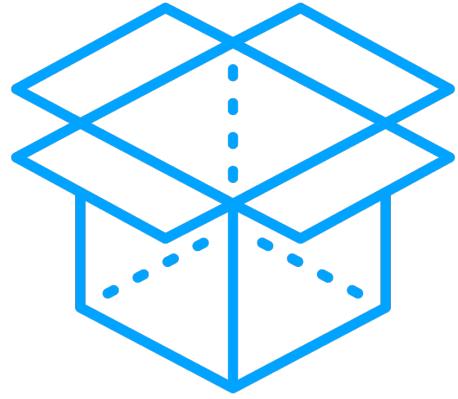
- Mixture-of-Experts architecture
- Good at coding and reasoning
- MIT license



Key Characteristics of Open-source LLMs

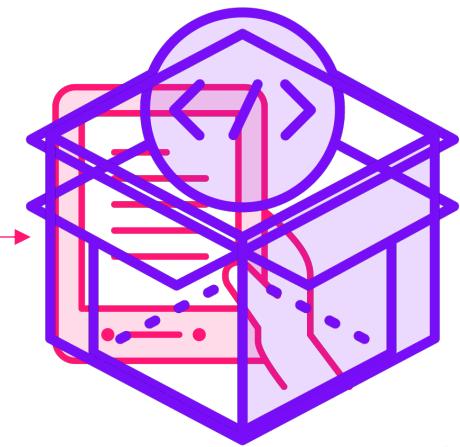
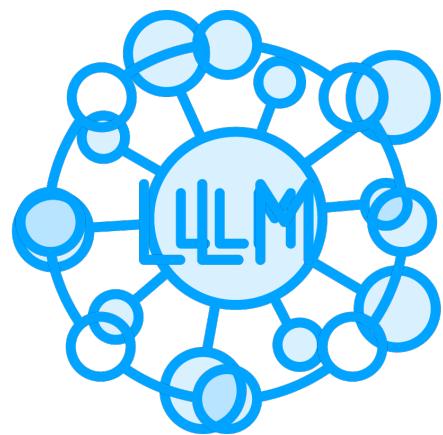
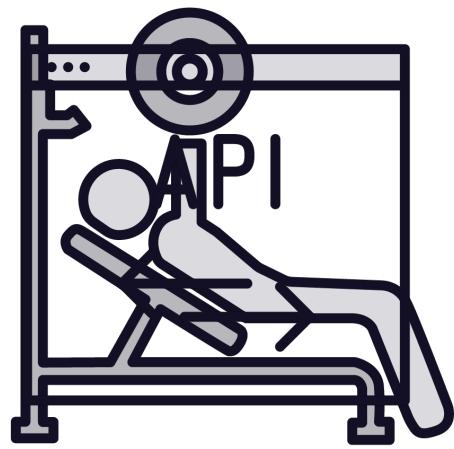


Characteristics of Open-source LLM

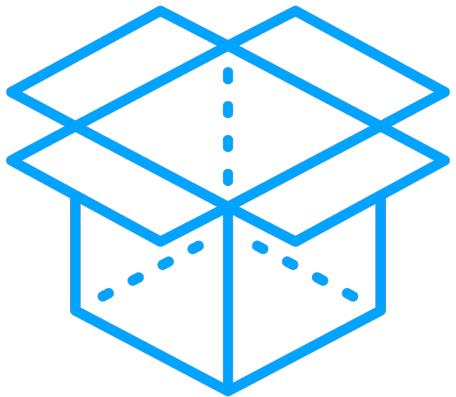


**Freely Available
Model Weights**

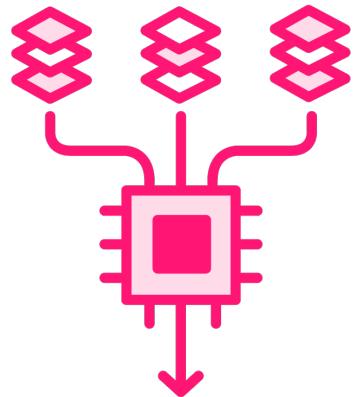




Characteristics of Open-source LLM

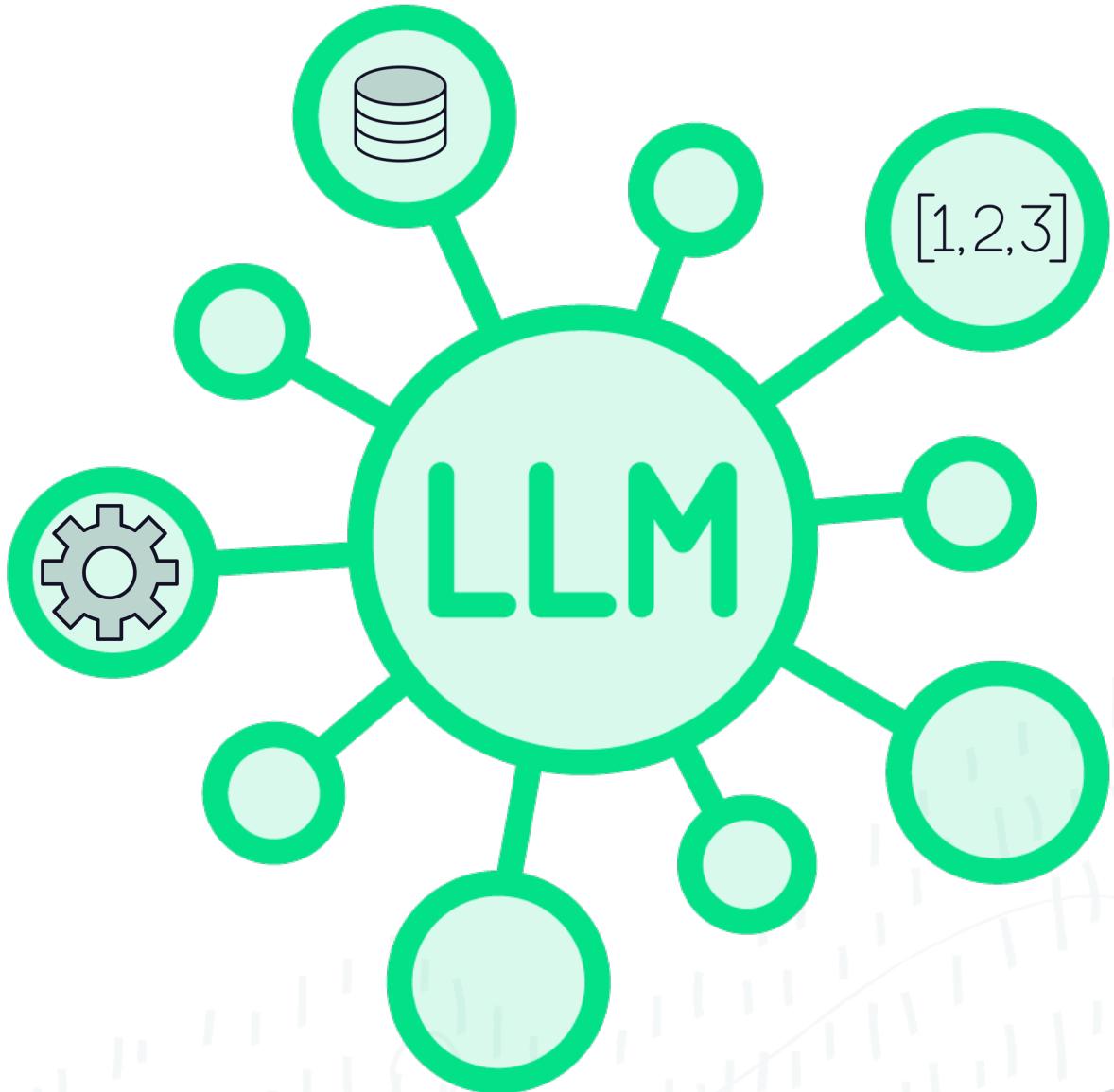
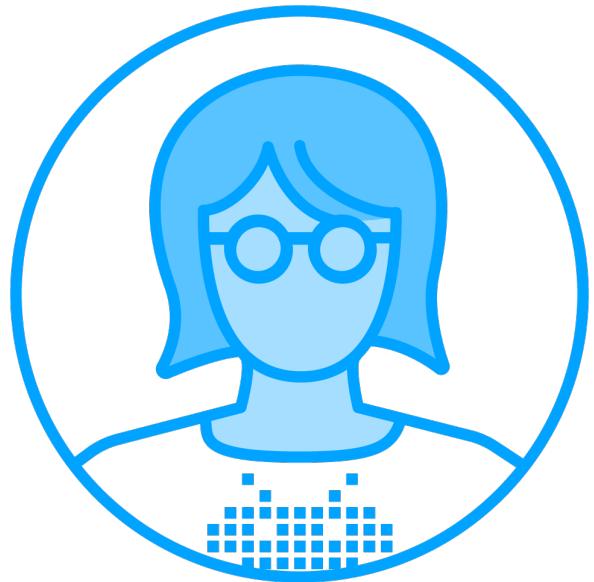


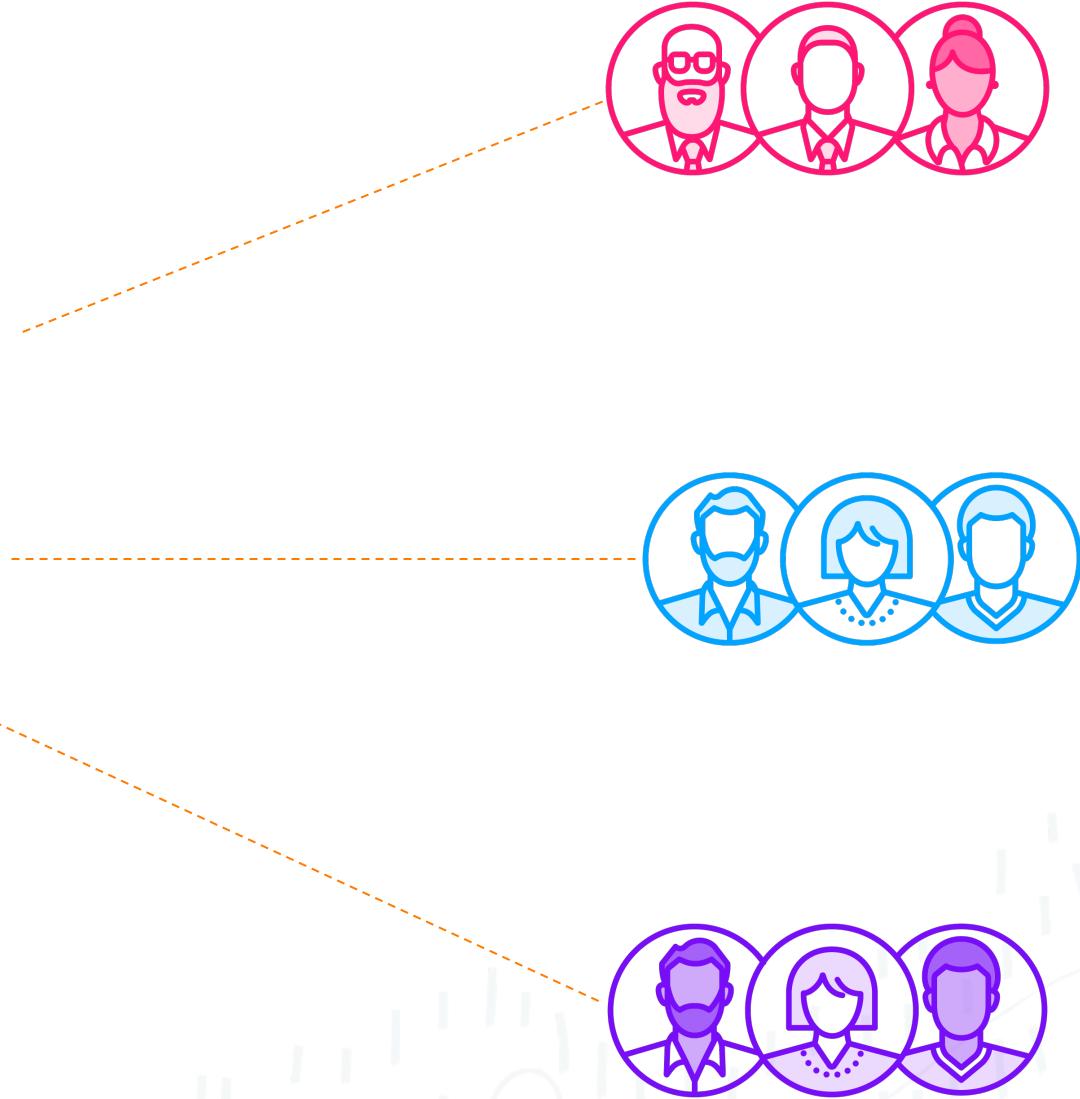
**Freely Available
Model Weights**



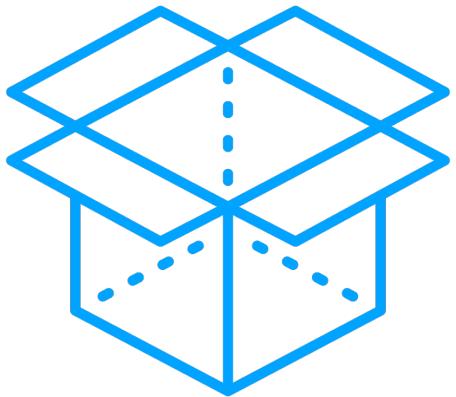
**Modifiable
Architectures
and Training
Approaches**



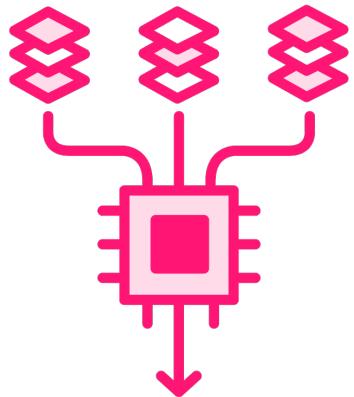




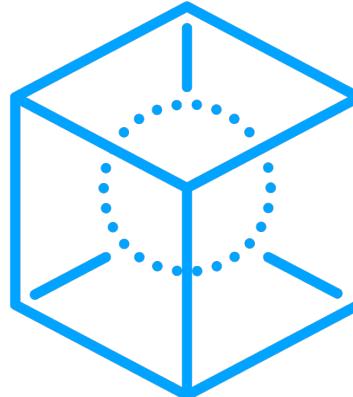
Characteristics of Open-source LLM



**Freely Available
Model Weights**



**Modifiable
Architectures
and Training
Approaches**



**Transparent
Documentation
and
Reproducibility**



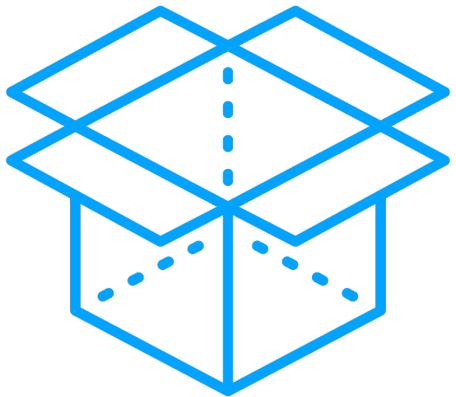


Developers of open source model release:

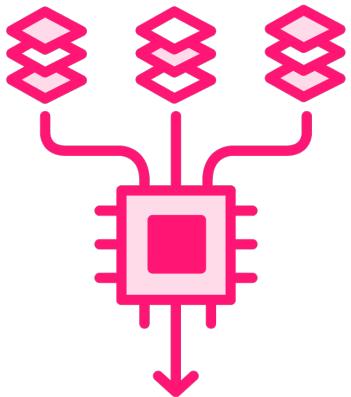
- Benchmarks
- Training logs
- Multilingual data coverage
- Performance reports



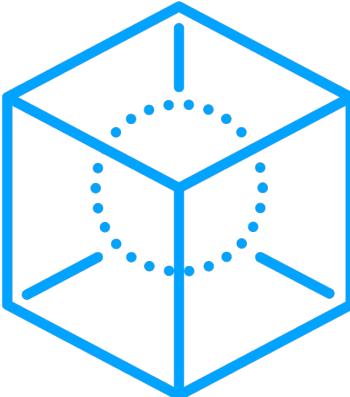
Characteristics of Open-source LLM



**Freely Available
Model Weights**



**Modifiable
Architectures
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Approaches**

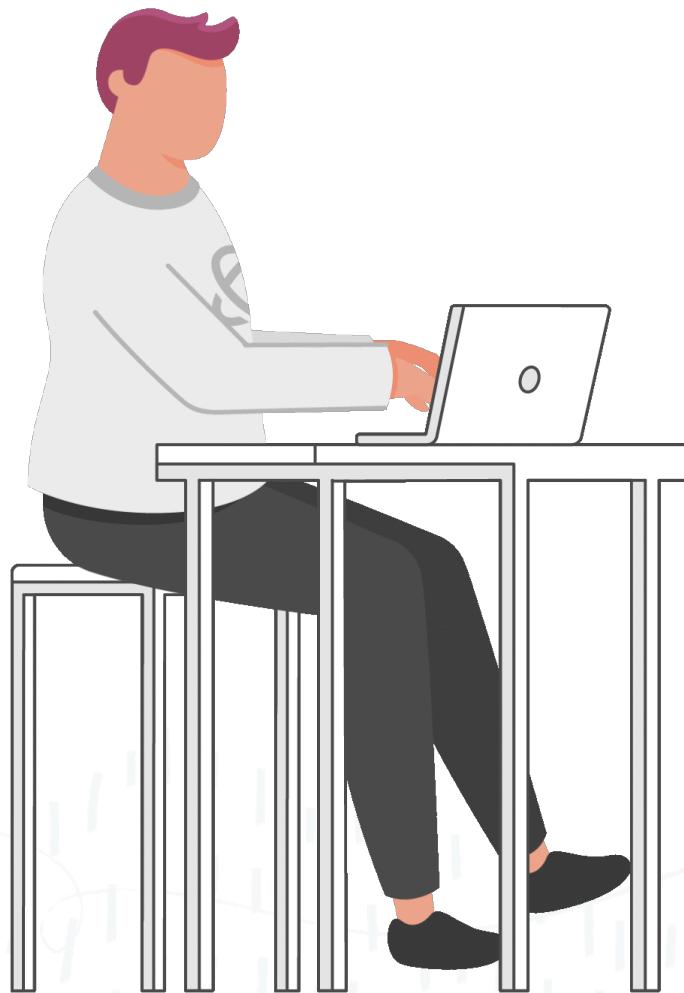


**Transparent
Documentation
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Reproducibility**



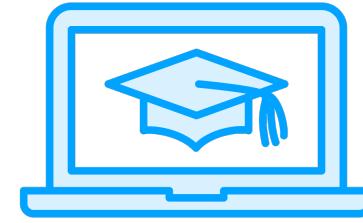
**Community-
Driven
Improvements**





<>









Recap:

- Free available weights
- Modifiable architectures
- Reproducible and collaborative





Benefits for Businesses and Developers

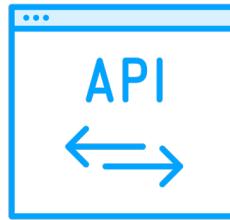


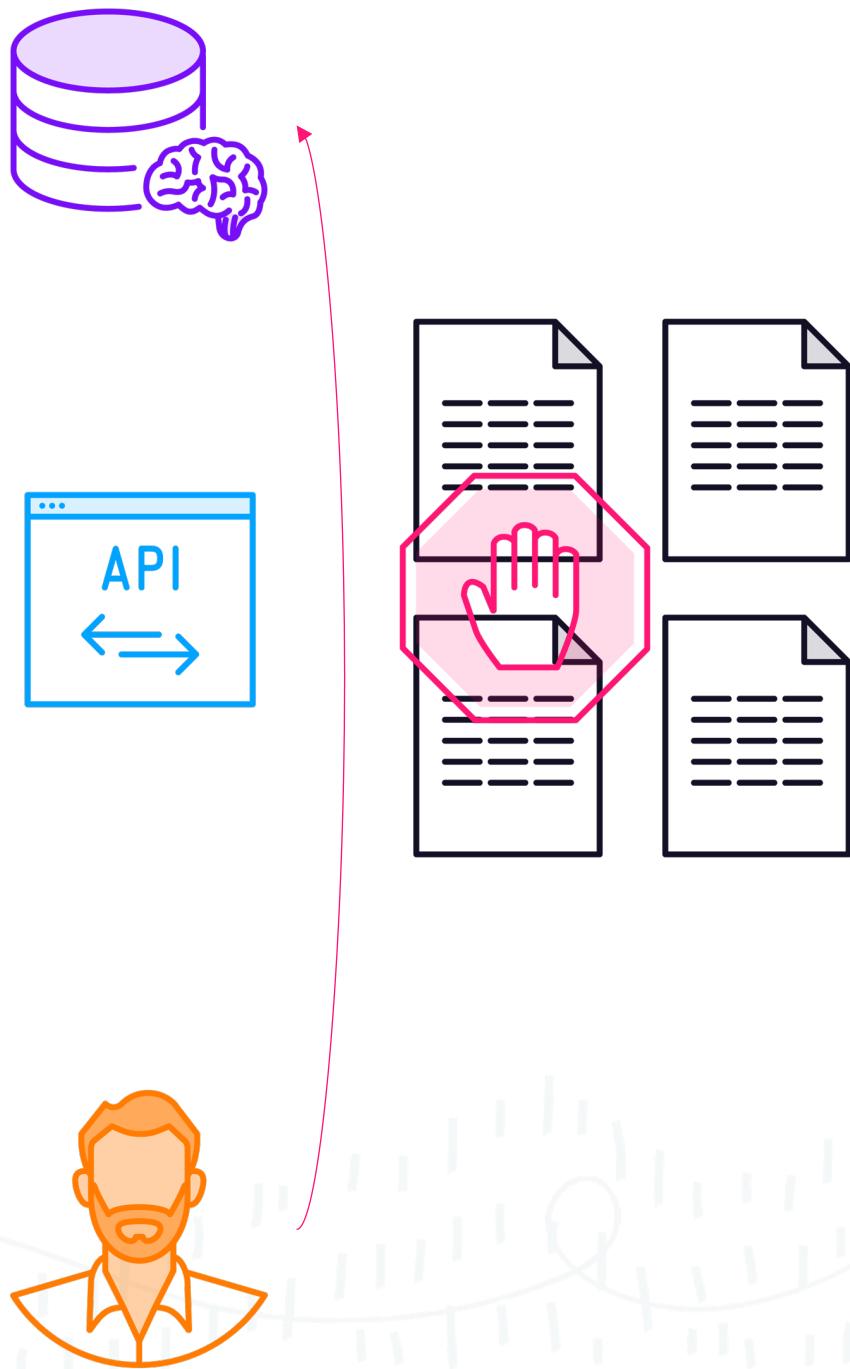


Benefits:

- Greater control over model behavior









Benefits:

- Greater control over model behavior
- Enhanced data privacy and security







Benefits:

- Greater control over model behavior
- Enhanced data privacy and security
- Cost savings



Closed vs Open-source - Costs

Closed Source

vs.

Open Source

No upfront costs

Costs go up as application scales

Upfront costs for infrastructure

No costs for each request





Benefits:

- Greater control over model behavior
- Enhanced data privacy and security
- Cost savings
- Faster iteration cycles



Closed-source Models Limitations

Development is slow

The model is a black box

Backwards compatibility



Open-source Models Benefits

**Multiple versions
can be tested**

**Debugging is
possible**

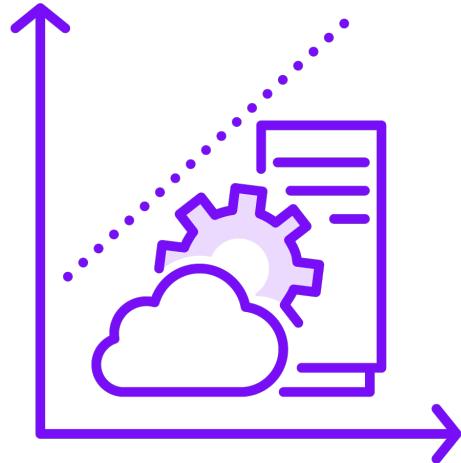
**No dependency on
third party roadmap,
stability or pricing
changes**



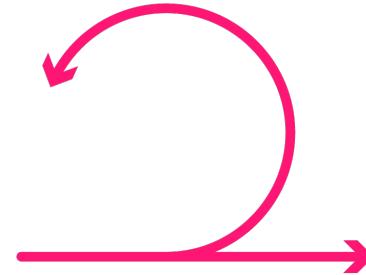
Open-source Benefits for Businesses and Developers



**Security to handle
sensitive data**



Help scale profitably



**Agility to outpace
competition**

